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10/562,414	12/23/2005	Jean-Francois Ranjard	PSA0311329	5455

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EXAMINER

WARTALOWICZ, PAUL A

ART UNIT	PAPER NUMBER
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1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,414	Applicant(s) RANJARD ET AL.	
	Examiner PAUL A. WARTALOWICZ	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-9, 11-13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claim 13 objected to because of the following informalities: it appears that the scope of claim 13 is coextensive of scope with claim 4. Therefore, it appears that claim 13 is a substantial duplicate of claim 4. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-9, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jorgensten et al. (US 2004/0052722) in view of Amendola (US 2004/0033194) and Amendola (US2003/0092877).

Jorgensten teaches a method of producing hydrogen comprising reacting sodium borohydride and water, wherein the sodium borohydride is in a concentration of 33-37% and wherein the temperature of the reaction is about 120 °C [0007, 0009, 0035] wherein the hydrolysis reaction produces sodium borate [0030]. It appears that the borate solution is at 120 °C as formed by the hydrolysis reaction (this is the initial temperature and the holding temperature). Additionally, it appears that at least a portion of the borohydride is converted to the borate such that the weight percent of sodium borate would encompass the range in claim 5.

Jorgensten fails to teach the duration of the reaction forming sodium borate and hydrogen.

Amendola '194, however, teaches that a typical reaction between sodium borohydride and water to produce sodium borate and hydrogen [0027] takes 11,000 seconds (equals 3.05 hours, figure 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to carry out the hydrogen producing method of Jorgensten for about 3 hours in order to carry out the hydrogen producing method for a typical duration as taught by Amendola '194.

As the reaction producing hydrogen and sodium borate lasts for about 3 hours, it appears that the borate products initially produced are present at a temperature of around 120 °C [Jorgensten, 0007, 0009, 0035] for around 3 hours (Amendola '194, figure 5) thus meeting the limitation of holding the holding temperature for 2-100 hrs.

Regarding the limitation of subjecting the sodium borate to heat treatment to reach a holding temperature: because the initial temperature of 100-180 °C recited in claim 3 overlaps with the holding temperature taught by Jorgensten (120 °C), it appears that subjecting the aqueous the aqueous solution of sodium borate to an initial heating or cooling operation is unnecessary to meet the limitation, or in the alternative that this step inherently is present to reach a temperature of 120 °C.

Jorgensten fails to teach cooling or heating the sodium borate after being held at 120 °C for about 3 hours.

Jorgensten teaches that the sodium borate can be removed and converted to hydride [0051].

Amendola '877 teaches a method for making sodium borohydride from sodium borate [0002, 0016] wherein sodium borate is transported to an initial reaction at a temperature of 50-70°C [0042-0043].

As Jorgensten teaches that the sodium borate can be removed and converted to hydride [0051] and Amendola '877 teaches a method for making sodium borohydride [0002] wherein sodium borate is transported to an initial reaction at a temperature of 50-70°C [0042-0043], it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to transport the sodium borate produced in the hydrogen producing process of Jorgentsen to the initial reaction of Amendola '877 in order to recycle the sodium borate into hydride.

The temperature of the initial reaction taught by Amendola '877 appears to meet the limitation of the storage temperature of -50 to 300°C, and -20-50°C in claims 4 and 13.

Regarding claim 2, while it is claimed that there are two holding operations, only one holding time is specified as 2-100 hours. It appears that the other holding time can be different (see Applicant's specification at page 4, line 24-page 5, line 14). Therefore, it appears that when cooling the sodium borate from 120°C to 50-70°C, a second holding operation inherently occurs as the sodium borate solution passes through a temperature of, for example, 100°C for about 1 second.

Additionally, it appears that the cooling or heating step after holding at the holding temperature occurs at a speed overlapping with the range of 1°C/min to 100°C/min in the absence of a showing to the contrary.

Additionally, it appears that claim 6 encompasses a value of 0% of soda; therefore the claim does not actually require that soda is present in the aqueous solution of sodium borate.

Regarding claims 8 and 9, Jorgensten teaches the system for producing hydrogen is a fuel cell of a vehicle [0027].

Additionally, it appears that a viscous liquid has at least some solids therein and a substantially similar consistency as the sodium borate solid formed in the reaction [0030, Jorgensten]. Additionally, the process of Jorgensten does not appear to crystallize sodium borate.

Claims 1-4, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amendola (US 2003/0092877).

Amendola '877 teaches a method of making sodium borohydride [002] wherein sodium borate is produced in a first reaction that proceeds at 100°C for a duration of 30 seconds to 100 hours [0078-80] wherein after this reaction, the sodium borate is transported to a second reaction at a temperature of 50-70°C [0042-43,80].

As the first reaction producing sodium borate lasts for about for 30 seconds to 100 hours, it appears that the borate products initially produced are present at a temperature of around 100 °C [0078-80] for around 30 seconds to 100 hours thus overlapping with the limitation of holding the holding temperature for 15-100 hrs. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. MPEP 2144.05(I).

Regarding claim 2, while it is claimed that there are two holding operations, only one holding time is specified as 2-100 hours, or 8-100 hours in claim 11, or 15-100 hours in claim 12. It appears that the other holding time can be different (see Applicant's specification at page 4, line 24-page 5, line 14). Therefore, it appears that when cooling the sodium borate from 100°C to 50-70°C, a second holding operation inherently occurs as the sodium borate solution passes through a temperature of, for example, 90°C for about 1 second.

Additionally, it appears that the cooling or heating step after holding at the holding temperature occurs at a speed overlapping with the range of 1°C/min to 100°C/min in the absence of a showing to the contrary.

Regarding the limitation of subjecting the sodium borate to heat treatment to reach a holding temperature: because the initial temperature of 100-180 °C recited in claim 3 overlaps with the holding temperature taught by Jorgensten (120 °C), it appears that subjecting the aqueous the aqueous solution of sodium borate to an initial heating or cooling operation is unnecessary to meet the limitation, or in the alternative that this step inherently is present to reach a temperature of 120 °C.

The temperature of the second reaction taught by Amendola '877 appears to meet the limitation of the storage temperature of -50 to 300°C, and -20-50°C in claims 4 and 13.

Additionally, Amendola '877 teaches that the sodium borate is in liquid form which would inherently exhibit a certain degree of viscosity absent a showing to the contrary.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz

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November 21, 2009

/Stanley Silverman/
Supervisory Patent Examiner, AU 1793